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REMARKS

This is a full and timely response to the non-final Official Action mailed September 12, 2005. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claim Status:

By the present amendment, claim 24 is amended. These amendments to claim 24 are made to clarify the language of the claim and are not intended to, and do not, narrow or change the scope of the claims.

No claims are cancelled by the present paper. Original claims 37-49 were cancelled previously. New claim 65 is added herein. Thus, claims 1-36 and 50-65 are currently pending for further action.

Allowable Subject Matter:

In the recent Office Action, the Examiner allowed claims 30-36 and 58 and further indicated the presence of allowable subject matter in claims 53 and 56. Applicant wishes to thank the Examiner for the allowance of these claims and this identification of further allowable subject matter.

Prior Art:

The recent Office Action rejected claims 1-24, 50-52 54, 55, 57 and 59-62 as anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 6,100,007 to Pang et al. ("Pang"). For at least the following reasons, this rejection is respectfully traversed.

Claim 1 recites:

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A method for creating a three-dimensional solid freeform fabrication object with non-reactive powder comprising:  
spreading a non-reactive powder on a substrate;  
selectively dispensing a reactive resin directly onto said non-reactive powder, forming a mixture of reactive resin and non-reactive powder, wherein said mixture defines said three-dimensional object; and  
curing said reactive resin thereby encapsulating said non-reactive powder.

In contrast, Pang does not teach or suggest spreading a non-reactive powder on a substrate and selectively dispensing a reactive resin into said non-reactive powder. In this regard, the Office Action cited Pang at col. 18, lines 36-56. This portion of Pang reads as follows.

If necessary, the resin composition for stereolithography applications according to the present invention may contain other materials in suitable amounts, as far as the effect of the present invention is not adversely affected. Examples of such materials include radical-polymerizable organic substances other than the aforementioned cationically polymerizable organic substances; heat-sensitive polymerization initiators; various additives for resins such as coloring agents such as pigments and dyes, antifoaming agents, leveling agents, thickening agents, flame retardant and antioxidant; fillers such as silica, alumina, glass powder, ceramic powder, metal powder and modifier resins. Particular examples of the radical-polymerizable organic substances include but not limited to compounds that thermally polymerize, while those of the heat-sensitive polymerization initiator includes aliphatic onium salts disclosed in Japanese Patent Laid-Open Nos. 49613/1982 and 37004/1983.

The filler to be used in the present invention is a reactive or non-reactive, inorganic or organic, powdery, fibrous or flaky material.  
(Pang, col. 18, lines 36-56).

This portion of Pang merely teaches that a filler, that is to be mixed in a resin, can be provided in a variety of forms including powder. However, as would be well known to those of ordinary skill in the art, the filler described is added to the resin before the resin is shaped into a desired form using stereo lithography. (See Pang, col. 19, lines 33-36). Consequently, Pang does not ever teach or suggest that the filler in powder form is spread on a substrate and then a reactive resin is selectively dispensed into the powder layer as claimed.

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"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection of claim 1 and its dependent claims based on Pang should be reconsidered and withdrawn.

Independent claim 2 recites:

A method for creating a three-dimensional solid freeform fabrication object with non-reactive powder comprising:  
spreading a non-reactive powder on a substrate;  
heating a reactive resin to a temperature of about 40 to 200 degrees Celsius  
(C);  
selectively dispensing said heated reactive resin onto said non-reactive powder, forming a mixture of reactive resin and non-reactive powder, wherein said mixture defines said three-dimensional object; and  
curing said reactive resin thereby encapsulating said non-reactive powder.

As demonstrated above, Pang does not teach or suggest spreading a non-reactive powder on a substrate and selectively dispensing a reactive resin onto the non-reactive powder. For at least this reason, the rejection of claim 2 and its dependent claims should be reconsidered and withdrawn.

Moreover, as cited by the Office Action, Pang teaches heating a resin. (Office Action of 9/12/05, p. 2; See Pang, col. 20, lines 44-49). However, Pang teaches heating a resin so as to mix the filler into the resin. "The formulations indicated in the examples are prepared by mixing the components, with a stirrer at 20 to 80° C. (depending on viscosity) until a homogeneous composition is obtained." (Pang, col. 20, lines 44-47).

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Pang never teaches or suggests that the heated resin is selectively dispensed onto a layer of non-reactive powder spread on a substrate. For at least this additional reason, Pang fails to teach or suggest all the features of claim 2.

Again, "[a] claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection of claim 2 and its dependent claims based on Pang should be reconsidered and withdrawn.

Independent claim 3 recites:

A method for creating a three-dimensional solid freeform fabrication object with non-reactive powder comprising:  
spreading a non-reactive powder on a substrate;  
selectively dispensing a reactive resin onto said non-reactive powder, forming a mixture of reactive resin and non-reactive powder, wherein said mixture defines said three-dimensional object;  
applying ultrasonic energy to said mixture of reactive resin and non-reactive powder; and  
curing said reactive resin thereby encapsulating said non-reactive powder.

As demonstrated above, Pang does not teach or suggest spreading a non-reactive powder on a substrate and selectively dispensing a reactive resin onto the non-reactive powder. For at least this reason, the rejection of claim 3 and its dependent claims should be reconsidered and withdrawn.

Moreover, Pang does not teach or suggest applying ultrasonic energy to such a mixture of resin and non-reactive powder. The Office Action in this regard refers to Pang at col. 20, line 63 to col. 21, line 7. (Action of 9/12/05, p. 2). However, this portion of Pang

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does not even mention ultrasonic energy. Thus, Pang fails to teach or suggest all the features of claim 3.

Again, "[a] claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection of claim 3 and its dependent claims based on Pang should be reconsidered and withdrawn.

Independent claim 24 recites:

A solid freeform fabrication system for producing a three-dimensional object using non-reactive powder comprising:  
a powder spreading system configured to spread a specified quantity of non-reactive powder to form a layer of said powder on a substrate;  
a dispensing system adapted to selectively dispense both components of a two-part reactive resin onto said layer of non-reactive powder; and  
a computing device coupled to and configured to control said dispensing system and said powder spreading system.

In contrast, as explained above, Pang does not teach or suggest a powder spreading system configured to spread a specified quantity of non-reactive powder to form a layer of said powder on a substrate. Pang does not teach or suggest a dispensing system adapted to selectively dispense both components of a two-part reactive resin onto said layer of non-reactive powder."

Again, "[a] claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the

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rejection of claim 24 and its dependent claims based on Pang should be reconsidered and withdrawn.

Independent claim 59 similarly recites:

A method for creating a three-dimensional solid freeform fabrication object with non-reactive powder comprising:  
spreading a non-reactive powder on a substrate; and  
selectively dispensing both components of a two-part reactive resin onto said non-reactive powder, forming a mixture of reactive resin and non-reactive powder, wherein said mixture defines said three-dimensional object.

As demonstrated above, Pang does not teach or suggest spreading a non-reactive powder on a substrate and selectively dispensing a reactive resin onto the non-reactive powder. For at least this reason, the rejection of claim 59 and its dependent claims should be reconsidered and withdrawn.

Independent claim 62 recites:

A system for fabricating a three-dimensional solid freeform fabrication object with non-reactive powder comprising:  
a system for spreading a non-reactive powder on a substrate;  
an inkjet dispenser for selectively dispensing a reactive resin onto said non-reactive powder, forming a mixture of reactive resin and non-reactive powder, wherein said mixture defines said three-dimensional object; and  
a curing system for curing said reactive resin thereby encapsulating said non-reactive powder.

As demonstrated above, Pang does not teach or suggest a system for spreading a non-reactive powder on a substrate. Pang also does not teach or suggest a dispenser for selectively dispensing a reactive resin onto the non-reactive powder.

Moreover, Pang does not teach or suggest a system including an inkjet dispenser. The Office Action does not indicate how or where such a dispenser is taught by Pang. For at least

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these reasons, the rejection of claim 62 and its dependent claims should be reconsidered and withdrawn.

Claims 25-29 and 62 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Pang and U.S. Patent No. 5,902,527 to Almquist et al. This rejection is respectfully traversed for at least the same reasons given above with respect to claims 24 and 62.

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Conclusion:

The newly added claim is thought to be patentable over the prior art of record for at least the same reasons given above with respect to the original independent claims.

Therefore, examination and allowance of the newly added claim is respectfully requested.

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: 29 November 2005

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Jeffrey K. Riddle